Claims

What is claimed is:

1. A balloon for a medical device formed from a length of tubing of a polymer material by radial expansion of the tubing under pressure, the polymer material comprising a melt blend product of at least two thermoplastic polymers, a first of said polymers being an engineering resin having by a flexural modulus of about 240,000 psi or greater and a second of said polymers being a block copolymer elastomer having a flexural modulus of about 150,000 psi or less, the block copolymer including at least one block which is structurally similar to the engineering resin.

2 A balloon as in claim 1 wherein the said first and second polymers are a pair selected from the group consisting of polyamides and polyamide elastomers; engineering polyurethane resins and polyurethane elastomers; aromatic polyesters or copolyesters and aromatic polyester-polyether block copolymers; aromatic polyesters and polyurethane-polyester block copolymers; and polycarbonates and polycarbonate urethane elastomers.

3 A balloon as in claim 1 wherein the second polymer is characterized as follows:

the block copolymer comprises two or more hard segments of a polyester or polyamide and two or more soft segments of polyether;

the polyester hard segments are polyesters of an aromatic dicarboxylic acid and a C_2-C_4 diol,

the polyamide hard segments are polyamides of C_6 or higher carboxylic acids and C_6 or higher organic diamines or of C_6 or higher aliphatic ω-amino-α-acids, and

the polyether soft segments are polyethers of C_2-C_{10} diols,

the block copolymer has a hardness, Shore D scale, of greater than 60; and

the percentage by weight of the block polymer attributable to the hard segments is between about 50% and about 95%.

4. A balloon as in claim 3 wherein the block copolymer has a Shore D hardness in the range of 65-75 and a flexural modulus in the range of 50,000-120,000 psi.

5. A balloon as in claim 3 wherein the hard segments of the block copolymer are polyamide segments.

6. A balloon as in claim 3 wherein said polyether segment, is selected from the group consisting of poly(tetramethylene ether), poly(pentamethylene ether) and poly(hexamethylene ether).

7. A balloon as in claim 3 wherein the hard segments of the block copolymer are polyester segments.

8. A balloon as in claim 7 wherein said polyester segments are polyesters of an acid selected from the group consisting of ortho-, meta- or para- phthalic acid, napthalenedicarboxylic acid and meta-terphenyl-4,4'-dicarboxylic acids and a diol selected from the group consisting of ethylene glycol, 1,3-propane diol and 1,4-butane diol.

9. A balloon as in claim 1 wherein

the first polymer is selected from the group consisting of polyethylene terephthalate, polyethylene naphthanate, polyethylene terephthalate-polyethylene isophthalate copolymer, polybutylene terephthalate and polybutylene naphthanate, and,

the second polymer is selected from the group consisting of aliphatic polyester polyurethanes, and poly(butylene terephthalate-*block*-poly(tetramethylene oxide)).

10. A balloon as in claim 1 having a wall strength greater than 20,000 psi.

11. A balloon as in claim 1 having a semi-compliant to non-compliant distension profile whereby as inflation pressure is increased from 6 atm to 12 atm, the balloon expands from a nominal diameter at the 6 atm pressure to an increased diameter at the 12 atm pressure which is from about 5% to about 16% greater than said nominal diameter.

12. A balloon as in claim 1 having a nominal diameter of between 1.5 mm and 4.0 mm, the balloon having a burst pressure of at least 12 atm.

13. A dilation catheter having a elongated tubular body, a balloon mounted on a distal end thereof and means for inflation of the balloon, wherein the balloon is a balloon as in claim 1.

14. A balloon a for a medical device formed from a length of tubing of a polymer material by radial expansion of the tubing under pressure, the polymer material comprising a polyamide/polyetherpolyester, the balloon having a compliance curve characterized by a hybrid compliance curve in which a segment of the curve between 6 atm and 10 atm has a slope corresponding to a growth rate of from about 1.5% to about 5% per atm from a reference diameter at 6 atm and a second segment of the curve between 12 and 16 atm has a growth rate of from about 0.3 % to about 1.5% per atm from a reference diameter at 12 atm.

15. A dilation catheter having an elongated tubular body, a balloon mounted on a distal end thereof and means for inflation of the balloon, wherein the balloon is a balloon as in claim 1.

16. A balloon for a medical device formed from a length of tubing of a polymer material by radial expansion of the tubing under pressure, the polymer material comprising a polyamide-polyether-polyester, the balloon having a compliance curve characterized by a hybrid compliance curve in which a segment of the curve between 6 atm and 10 atm has a slope corresponding to a growth rate of from about 1.5% to about 5% per atm from a reference diameter at 6 atm and a second segment of the curve between 12 and 16 atm has a growth rate of from about 0.3 % to about 1.5% per atm from a reference diameter at 12 atm.

17. A balloon for a medical device characterized by a wall strength of at least 18,000 psi, a distension over the range of 88-235 psi of at least 12 % and a non-linear compliance curve comprising initial and final segments, the initial segment having a growth rate greater than the final segment .

18. A balloon as in claim 17 wherein said wall strength is at least 20,000 psi.

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